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ABSTRACT

Two studies investigated the processing of metaphor, specifically (1) the extent to which metaphor is processed similarly to literal language and (2) the effects of the presence or absence of a specific context on processing. In the first study, 82 college students listened to one of four taped lectures, each containing 22 metaphors. The tapes differed only in the eight target sentences and recognition stimuli used. In the tapes, the target stimuli were followed either by the identical expression or by a parallel expression. Thus the stimuli were presented in four conditions: metaphor/metaphor, metaphor/paraphrase, paraphrase/paraphrase, and paraphrase/metaphor. At regular intervals after the target stimulus, the tapes were interrupted and the subjects were asked to identify the stimulus as identical, roughly synonymous, or neither identical nor synonymous to the target metaphor. The most correct identifications occurred in the metaphor/metaphor condition. In the second study, 48 college students listened to tapes containing the same metaphors and paraphrases. In one condition, the metaphors and paraphrases were presented together but out of context; in the other condition, the tape provided context for the metaphor for the metaphor/paraphrase pair. When asked to rate the adequacy of the paraphrase for the metaphor, the subjects gave the highest ratings to paraphrases in the "in-context" condition. (FL)

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The Processing of Metaphors and their Paraphrases in Context

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In the two thousand years since Aristotle's classic treatise on rhetoric hundreds of rhetoricians, philosophers, literary critics, linguists, and psychologists have expounded on various issues concerning metaphor (cf. Shibles, 1971). The following formal issues have dominated the literature: (1) how to differentiate metaphor from literal language or from other instances of figurative language (e.g., Hawkes, 1972; Theodore, 1976), (2) how to describe the constituents of metaphor (e.g., Richards, 1936), and (3) how to classify metaphor (e.g., Brooke-Rose, 1958). No consensus of opinion has emerged on these formal issues. Moreover, the psychological studies of metaphor have not been conducted within any consistent theoretical framework (cf. Billow, 1977), and the issues investigated in these studies have generally not related directly to the formal issues. Typically, the empirical investigations have considered the effect of the presence or absence of metaphor, however characterised, on various cognitive tasks. For example, Verbrugge and McCarrell (1977) investigated the effectiveness of the metaphorical "ground" as a recall cue. Other recent investigations have focused on the effects of the presence or absence of metaphor on an audience's attitudes and perceptions of a speaker (Reinsch, 1973), on reading comprehension (Elam, 1978), and on the retention of prose material (Pearson, Raphael, TePaske & Hyser, Note 1). These studies have presupposed that metaphor is processed differently from literal language, and therefore have predicted differential effects on the various dependent variables in question.

The research to be reported in this paper will focus on the actual processing of metaphor, in particular, on the extent to which metaphor is processed similarly to or differently from literal language, and on the effects on processing of the absence or presence of a specific context.

The issue of differential processing of literal and figurative language is based primarily in linguistic theory that identifies metaphor in terms of its deviation from normal syntactic rules (e.g., Bickerton, 1969; Thomas, 1969). Some psychological theory, on the other hand, suggests that cognitive strategies may be used in the comprehension of metaphor as part of normal language processing (Blaubergs and Jarrett, 1977; Hörmann, 1971; Kintsch, 1974). One investigator, Harris (1976) has postulated a two-stage processing model for metaphor in contrast to single stage processing of literal language. His finding of no significant difference between the time needed to comprehend Shapespearian metaphors, contemporary language metaphors, and paraphrases of the metaphors did not support his hypothesis of differential processing.

The question of differential processing of literal and figurative language received further attention in a study that also considered the effect of context on the processing of meatphor. Ortony, Schallert, Reynolds, and Antos (1978) did find some differences in the time required to process literal vs. metaphorical expressions when the context provided was relatively brief, but these time differences disappeared when more detailed contexts were provided. However, their paradigm involved the use of identical expressions that could be interpreted either literally or metaphorically depending on the context. Reddy (1969) has proposed a semantically focused linguistic theory of metaphor that asserts that any literal expression can be interpreted as a metaphor given an appropriate context. However, while some metaphors occur as literal expressions, many metaphors do violate linguistic rules and are thus interpretable only as metaphors. In general, however, the second theoretical issue, the effect of context on the processing of metaphor has not been included in linguistic analyses of metaphor, but is increasingly being recognized as a significant factor in psychological studies. Blaubergs (1974) investigated the processing of linguistically deviant

sentences and found that such sentences can be interpreted metaphorically by people who imagine a suitable context. Blaubergs and Jarrett (1977) found further that different contexts affect the degree of interpretability of linguistically deviant sentences.

Metaphoric processing of linguistically deviant sentences in context may entail a greater focus on the syntactic form versus the semantic content than occurs when semantically and syntactically well-formed sentences are processed in context. Sachs (1967) has developed a useful paradigm for contrasting the processing of form versus content in literal language. She used a recognition memory task in which target sentences in a prose passage were followed at a specific time interval by either the identical or a changed stimulus. She found that only the semantic content was consistently recognized at intervals greater than 80 syllables. Other researchers have substantiated these findings (e.g., Trembath, 1972), but no one to our knowledge has examined the processing of metaphor in context using this paradigm. One related study, however, that of Bock and Brewer, reported in Ortony, Reynolds and Arter (1978), has examined recognition memory for the form as well as the semantic content of one-sentence-long proverbs (e.g., "Out of another's purse it is easy to be generous") presented without any contextual support. In a two-alternative forced-choice recognition test given five minutes after presentation of stimuli, participants were able to successfully recognize semantic changes and synonym substitutions, as well as optional transformation (e.g., "It is easy to be generous out of another's purse"). However, additional research is needed to determine if recognition of the form of other types of figurative language and/or figurative language processed in a supporting context will be greater than recognition of the form of equivalent literal language.

A final issue is the choice of appropriate stimuli. Clark (1973) has emphasized the fallacy of treating any language stimulus as a fixed effect, while Gaus

(1979) has questioned the "ecological validity" of many metaphors used as stimuli (e.g, "Hair is spaghetti"). We have addressed the problem of ecological validity by using as stimuli metaphors that comprised part of the actual content of a lecture on measurement and evaluation. Additionally, we tried to sample more adequately from the entire domain by choosing metaphors that varied in complexity and in vividness.

The two central hypotheses of the present studies are, firstly, that contextually embedded metaphorical expressions are retained in memory differently than their literal counterparts or paraphrases are, i.e., that the form of a metaphor is retained along with its semantic content while only the semantic content of a literal expression is retained after initial processing; and secondly, that the adequacy of a paraphrase of a metaphorical expression is greater in a specific context than out of context, i.e., that part of the interpretation of a metaphor comes from its context.

Method

Study 1. Participants in the first study were 82 students in introductory educational psychology classes.

The materials in the first study were four tape-recorded lectures on measurement and evaluation. Each tape was 20 minutes long and contained 22 metaphors. Eight of the mataphors served as target stimuli and were matched by eight target papaphrases. However, each taped lecture contained only four target metaphors and four target paraphrases. The target stimuli were followed by either the identical expression or by the parallel expression, e.g., a metaphor that served as a target stimulus would be followed by either the same metaphor or by the paraphrase of that metaphor as the stimulus for recognition. Thus the four tapes each presented stimulus pairs in four conditions: (1) metaphor--metaphor, (2) paraphrase--paraphrase, (3) metaphor--paraphrase, and (4) paraphrase--metaphor.

The lectures were interrupted an average of 130 syllables after each target stimulus occurred, at which time the recognition stimulus was presented, and the participants were asked to identify it as (1) identical, (2) roughly synonymous, or (3) neither identical nor synonymous. The participants were also asked to indicate their level of confidence in their decision on a scale from 1 (outright guess) to 7 (completely certain). A one-page answer sheet was provided. Each class heard only one tape. The lecture was presented as part of the instructional content of the course.

Study 2. Participants in the second study were 48 students in introductory English classes. The same eight metaphors and their paraphrases were used. There were two conditions in the study: one in which the metaphors and their paraphrases were presented together but out of context, and one in which a written version of the lecture provided the context for each metaphor/paraphrase pair. In the second condition, the lecture was subdivided into sections and only the relevent section appeared along with the metaphor/paraphrase pair in booklet form with separate pages for the eight pairs of stimuli. The participants were asked to rate the adequacy of the paraphrase for the metaphor on a five-point scale from 5 (excellent) to 1 (poor). Participants were also given an opportunity to write a better paraphrase of the meaning of the metaphor.

Results

Study 1. Separate chi-square analyses were performed on each of the eight metaphor/paraphrase pairs in the four conditions to investigate the associations between condition and participant's classification of stimuli as identical, roughly synonymous, or neither identical nor synonymous to some previous expression that occurred in the lecture. The eight chi-squares (df = 6) ranged in value from 36.42 ($p < .001$) to 91.01 ($p < .001$). While there were some differences in the frequency of classifications among the different pairs for the metaphor-paraphrase

and the paraphrase-metaphor conditions, the metaphor-metaphor condition resulted in significantly more correct classifications as "identical" than did the paraphrase-paraphrase condtion in all eight analyses. A summary of the frequencies of choosing each of the three possible response for each condition appears in Table 1.

Table 1

Total frequencies of the three categories of recognition response for the four conditions for all stimulus pairs.

	Condition			
Recognition Response	Metaphor/ Metaphor	Metaphor/ Paraphrase	Paraphrase/ Paraphrase	Paraphrase/ Metaphor
Identical	151	35	85	3
Roughly Synonymous	21	89	67	54
Neither	8	62	34	127
Total Valid Responses	180	186	186	184

In order to further investigate differences among the four conditions, total scores of correct classifications for each condition were computed. A classification of "identical" was scored as correct for the metaphor-metaphor and paraphrase-paraphrase conditions and a classification of "roughly synonymous" was scored as correct for the paraphrase-metaphor and the metaphor-paraphrase conditions. A 4 x 4 repeated measures analysis of variance was performed with tape number (1-4) the between subjects factor and condition the within subjects factor. The tape main effect was significant, F (3, 78) = 4.66, $p < .01$, as was the treatment effect, F (3, 234) = 57.02, $p < .001$, and the interaction, F (9, 234) = 4.43, $p < .001$. Average scores among tapes ranged from .48 (Tape 1)

to .85 (Tape 2). A Dunn's Multiple Comparison Procedure was used to investigate differences among conditions. The metaphor-metaphor condition resulted in significantly higher correct identification scores than did the paraphrase-paraphrase, the metaphor-paraphrase, or the paraphrase-metaphor conditions. In order, the means were 1.51, 0.44, 0.41, and 0.15.

A 4 x 4 repeated measures analysis of variance was also performed on the participants' confidence ratings with tape number the between-subjects factor and treatment the within-subjects factor. A significant effect for treatment was found, F (3, 231) = 28.69, $p < .001$, and a Dunn's Multiple Comparison test indicated significant differences between confidence ratings for classification in the metaphor-metaphor condition (mean = 6.14) when compared with the paraphrase-paraphrase condition (mean = 5.00), the metaphor-paraphrase condition (mean = 4.75) and the paraphrase-metaphor condition (mean = 5.48).

Study 2. The data from the paraphrase adequacy experiment were analyzed by a 2 x 8 repeated measures analysis of variance with context condition the between-subjects factor and pair the within-subjects factor. A main effect for context was found, F (1, 47) = 22.72, $p < .001$). On a scale of 1 (poor) to 5 (excellent), the paraphrases of metaphors in context were rated significantly higher (mean = 2.78) than were the paraphrases of metaphors out of context (mean = 2.10).

Discussion

In Study 1 the finding that more stimuli in the metaphor-metaphor condition than in the paraphrase-paraphrase condition were identified as "identical" supports the hypothesis that the form as well as the semantic content of the metaphor is retained after initial processing while only the semantic content of a literal expression is retained after initial processing.

The results from Study 2 support the hypothesis that the semantic equivalency of paraphrases to metaphorical expressions is greater in context than out of context.

With regard to this second finding we suggest that studies which do not investigate metaphors and paraphrases in context be viewed with caution. The indication of lessened semantic similarity between metaphors and paraphrases presented out of context may explain the discrepancy in the findings of this study and Harris' (1976) finding of no significant differences in recognition for metaphors and paraphrases since Harris' stimuli were presented out of context.

Moreover, if the form of metaphor plays an important role in the processing of metaphor, the Ortony, Schallert, Reynolds & Antos (1978) study is not definitive because the metaphors that were used in that study could be interpreted either as literal expressions or as metaphors, depending on the context. Metaphors which violate syntactic and semantic rules whether considered in or out of context may in fact differ in how they are processed from metaphors that require a specific context for their processing as metaphors.

Thirdly, an interesting comparison can be made between the recognition responses in the metaphor-paraphrase condition and the paraphrase-metaphor condition. By inspection of Table 1, it can be seen that 127 responses occurred labelling the metaphor recognition stimulus as neither identical to nor synonymous with the equivalent literal expression that occurred in the lecture, whereas only 62 responses occurred labelling the paraphrase recognition stimulus as neither identical to nor synonymous with the equivalent metaphor that had occurred in the lecture. These differences are congruent with the processing model we are proposing. That is, when the metaphor is presented in context, subjects are able to determine its meaning and/or retain its form so that when the paraphrase is presented subsequently, those who no longer retained the syntactic form label it identical and those who retain both form and meaning label it as synonymous (the majority of responses). In the paraphrase-metaphor condition, however, the metaphor is heard out of context,

and subjects have greater difficulty determining a specific meaning to compare with what has preceeded the stimulus on the tape. The great majority label the stimulus metaphor, then, as neither identical to nor synonymous with the preceeding equivalent expression.

There are several limitations on the interpretation of this present research. Firstly, as in almost all psychological and educational studies of metaphor, insufficient attention has been paid to differences among the individual stimuli. The assumption that all metaphors are processed similarly no matter what their semantic content, surface form, position in a passage, or classificational nature in a given taxonomy is unwarranted. Therefore, the present studies must be considered as a preliminary investigation of the processing of metaphor. However, other studies are underway to investigate differences in processing that may be attributable to differences in types of metaphoric stimuli. To the extent that the metaphors used in the present studies are not representative of the domain, we will attenuate our interpretations of the present results.

A second limitation of the present research is that the results are compatible with more than one theoretical interpretation. It is possible to argue that the increased recognition of the metaphoric expressions is due not to the storage of the structure of the expression per se but to the effects of a dual processing, i.e., of the literal meaning and the metaphorical meaning. To test this hypothesis would require that the meanings of the metaphor remain the same but that the form of the stimuli be transformed in various ways. Another alternative explanation for these data could be constructed around the hypothesis that the metaphors and their paraphrases are differentially recognized because of differences in imagery effects (cf. Paivio, 1971). The possible effects of imagery are currently being investigated using the same stimulus materials.

Reference Notes

1. Pearson, P., Raphael, T., TePaske, N., Hyser, C. The function of metaphor in children's recall of expository passages. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April, 1979.

References

Bickerton, D. Prolegomena to a linguistic theory of metaphor. Foundations of Language, 1969, 5, 34-52.

Billow, R. M. Metaphor: A review of the psychological literature. Psychological Bulletin, 1977, 84, 81-92.

Blaubergs, M. S. Semantic anomaly from a psychological perspective. Athens, Georgia: University of Georgia, 1974. (ERIC Document Reproduction Service No. ED 098 790)

Blaubergs, M. S., & Jarrett, K. H. Semantic anomaly: Linguists' intentions versus interpretation in context. In F. Eckman (Ed.), Current themes in linguistics. New York: Halstead Press, 1977.

Brooke-Rose, C. A grammer of metaphor. London: Secker and Warburg, 1958.

Clark, H. H. The language-as-fixed-effect fallacy: A critique of language statistics in psychological research. Journal of Verbal Learning and Verbal Behavior, 1973, 12, 335-359.

Elam, A. H. Metaphor: Its effect on the reading comprehension of sixth graders. Unpublished doctoral dissertation, University of Georgia, 1978.

Gaus, P. J. Recent research on children's metaphoric understanding. Tucson, Arizona: University of Arizona, 1979. (ERIC Document Reproduction Service No. ED 170 725)

Harris, R. J. Comprehension of metaphors: A test of the two-stage processing model. Bulletin of the Psychonomic Society, 1976, 8, 312-314.

Hawkes, T. Metaphor. London: Methuen & Co., 1972.

Hörmann, H. Semantische anomalie, metapher und witz oder schlafen farblose grüne ideen wirklick wütend? Folia Linguistica, 1971, 5, 310-330.

Kintsch, W. The representation of meaning in memory. Hillsdale, N. J.: Lawrence Erlbaum, 1974.

Ortony, A., Reynolds, R., & Arter, J. Metaphor: Theoretical and empirical research. Psychological Bulletin, 1978, 85, 919-943.

Ortony, A., Schallert, D., Reynolds, R., & Antos, S. Interpreting metaphors and idioms: Some effects of context on comprehension. Journal of Verbal Learning and Verbal Behavior, 1978, 17, 464-477.

Reddy, M. J. A semantic approach to metaphor. Papers from the fifth regional meeting of the Chicago Linguistics Society, April, 1969.

Richards, I. A. The philosophy of rhetoric. London: Oxford University Press, 1936.

Reinsch, N. L. Attitudinal effects of brief and extended similes and metaphors (Doctoral dissertation, University of Kansas, 1973). Dissertation Abstracts International, 1973, 34, 7914A. (University Microfilms No. 74-12,619).

Sachs, J. S. Recognition memory for syntactic and semantic aspects of connected discourse. Perception and Psychophysics, 1967, 2, 437-442.

Shibles, W. A. Metaphor: An annotated bibliography and history. Whitewater, Wisc: Language Press, 1971.

Theodore, M. F. Figures of speech and style in poetry. Philadelphia: Dorrance and Co., 1976.

Thomas, O. Metaphor and related subjects. New York: Random House, 1969.

Trembath, A. A. Comparison of sensitivity to the surface and deep structure of sentences in children. Language and Speech, 1972, 15, 51-57.

Verbrugge, R. R., & McCarrell, N. S. Metaphoric comprehension: Studies in reminding and resembling. Cognitive Psychology, 1977, 9, 494-533.